Engine Combustion Network

Jet Penetration

Shadowgraph or Schlieren imaging were used to identify the vapor boundary of a penetrating jet (Naber, SAE 960034). Collimated light is passed along a line of site through the combustion vessel. A concave mirror or large collection lense is used to direct the light onto a high-speed camera sensor. Shadowgraph or Schlieren imaging techniqes are sensitive to gradients in refractive index, formed by either density or composition differences along a line-of-sight, and can therefore be used to mark the boundary of the vapor or liquid-phase of a penetrating jet. Examples of Sclieren imaging of vaporizing and non-vaporizing sprays are shown in the high-speed movie below.

Fig. 8.2.1. Fuel is #2 diesel fuel. Injector tip to wall is 109 mm.

The boundary of the spray is determined through image analysis. The penetration distance is defined as the distance along the spray axis to the boundary of the spray (Naber, SAE Paper 960034).

For further information, contact Web Grand Pooh-Bar
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